PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. Patent No. 7,768,251	)	Serial No. 10/548,086
	)	
Inventor(s): Eamonn Maher	)	Filed: May 4, 2007
	)	
Issue Date: August 3, 2010	)	Attorney Docket No. 000487.00041

For: SUPERCONDUCTING COIL TESTING

REQUEST FOR CERTIFICATE OF CORRECTION UNDER 37 CFR 1.322

U.S. Patent and Trademark Office
Customer Service Window
Randolph Building, Mail Stop: Certificate of Correction Branch
401 Dulany Street
Alexandria, VA 22314

Sir:

Pursuant to 35 U.S.C. § 254 and 37 C.F.R. § 1.322, Applicant requests the issuance of a Certificate of Correction in the above-identified patent. A copy of PTO Form 1050 is appended. The complete Certificate of Correction involves one page.

The mistake identified in the appended Form occurred through no fault of the Applicant, as clearly disclosed by the records of the application, which matured into this patent. Enclosed for your convenience is a copy of the Amendment filed April 20, 2010.

Issuance of the Certificate of Correction containing the correction is respectfully requested. Since this change is necessitated through no fault of the Applicant, no fee is believed to be associated with this request. Nonetheless, should the Patent and Trademark Office determine that a fee is required, please charge our Deposit Account No. 19-0733.

Respectfully submitted,

BANNER & WITCOFF, LTD.

Dated: February 7, 2011

By: /Jordan N. Bodner/
Jordan N. Bodner
Registration No. 42338

Banner & Witcoff, Ltd
1100 13th Street, N.W., Suite 1200
Washington, D.C. 20005-4051
(202) 824-3000

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO.: 7,768,251

DATED: August 3, 2010

INVENTOR(S): Eamonn Maher

It is certified that an error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 25, Claim 16, Line 26:

Please delete "locate the or each" and insert --locate each--.

Mailing Address of Sender:

Banner & Witcoff, Ltd.
1100 13th Street, N.W., Suite 1200
Washington, DC 20005-4051

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Electronic Acknowledgement Receipt

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Application Number:	10548086
International Application Number:	
Confirmation Number:	7642
Title of Invention:	Superconducting Coil Testing
First Named Inventor/Applicant Name:	Eamonn Maher
Customer Number:	22907
Filer:	Jordan N. Bodner/Jessica Williams
Filer Authorized By:	Jordan N. Bodner
Attorney Docket Number:	000487.00041
Receipt Date:	20-APR-2010
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Application Type:	U.S. National Stage under 35 USC 371

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		00048700041_amendment.pdf	136382 9b81177d3a1e72b975d5a33103d983f9a8c ecd87	yes	15

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Drawings-only black and white line drawings	2	2
	Claims	3	13
	Applicant Arguments/Remarks Made in an Amendment	14	15

Warnings:

Information:

2	Drawings-only black and white line drawings	00048700041_replacement_drawing_sheets.pdf	72407 f78e78adf48521d9e107de451c9a60d273550938	no	2

Warnings:

Information:

Total Files Size (in bytes):	208789

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	Confirmation No. 7642
	)	
Eamonn MAHER	)	Art Unit: 2831
	)	
Serial No. 10/548,086	)	Examiner: Amy He
	)	
Filed: May 4, 2007	)	Atty. Dkt. No. 000487.00041
	)	
For: SUPERCONDUCTING COIL TESTING	)	

AMENDMENT

Commissioner of Patents
U.S. Patent and Trademark Office
Customer Service Window, Mail Stop Amendment
Randolph Building
401 Dulany Street
Arlington, VA 22314

Sir:

This paper is responsive to the non-final Office Action mailed January 26, 2010. Please charge any fees due with this paper to our Deposit Account No. 19-0733. Also, any extensions of time needed for response are hereby requested.

Please amend the present application as follows.

IN THE DRAWINGS:

Please amend the drawings by replacing Figures 1 and 5 with the replacement drawing sheets submitted herewith. No new matter is added.

The only changes made to the drawings are to add text labels to reference numbers 12, 14, 16, 18, and 20 in Figure 1, to add text labels to reference numbers 90, 92, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, and 118 in Figure 5, and to re-draw Figure 5 to accommodate the space required for the newly-added text labels.

LISTING OF THE CLAIMS: This Listing of the Claims replaces all previous versions of the claims. Please amend the claims as follows.

1-43. (Canceled).

44. (Currently Amended) A method of fabricating a track in a layer of thin film material for use in a superconducting coil, the layer provided on a former having a substantially curved surface, the method comprising ~~the steps of~~:

scanning the layer to detect defects in the layer by probing a physical property of the material comprising the layer, without ~~the~~ a coil path being defined in the layer, to provide a data set of the physical property;

processing the data set to form a map having features indicating variations in the physical property over the layer;

analyzing the features of the map to identify and locate defects in the layer;

for each of the defects, identifying whether the defect is irreparable;

calculating an optimal path, wherein the path avoids any irreparable defects; and

defining the optimal path in the layer to define the coil track.

45. (Currently Amended) The method as claimed in claim 44, wherein the method further comprises ~~the steps of~~:

for each of the defects, identifying whether the defect is a repairable defect; and

repairing each repairable defect.

46. (Currently Amended) The method of fabricating a track as claimed in claim 44, wherein ~~the step of~~ calculating the optimal path includes calculating a plurality of different paths to optimize the performance of the coil track once defined in the layer and choosing the optimal path from the plurality of different paths.

47. (Currently Amended) The method of fabricating a track as claimed in claim 46, wherein ~~the step of~~ calculating the optimal path includes choosing from the plurality of different paths another path as the optimal path, if an inhomogeneity develops in the calculation.

48. (Currently Amended) The method of fabricating a track as claimed in claim 47, wherein ~~the step of~~ calculating the optimal path includes computing a path that avoids each weak area in the track that has an irreparable defect.

49. (Currently Amended) The method of fabricating a track as claimed in claim ~~548~~ 48, wherein ~~the step of~~ calculating the optimal path includes coupling other, non-weak, areas of the layer in series.

50. (Currently Amended) The method as claimed in claim 44, wherein ~~the step of~~ calculating the coil path comprises ~~the step of~~ adapting the path of the coil track such that the coil track produces a magnetic field that is predetermined.

51. (Currently Amended) The method as claimed in claim 50, wherein ~~the step of~~ adapting the coil path to rectify the shape of the field produced by the coil track also accounts for each field produced by each other existing coil track that comprises the coil.

52. (Currently Amended) The method as claimed in claim 50, wherein ~~the step of~~ adapting the coil path to rectify the shape of the field produced by the coil track also accounts for each field external to the coil.

53. (Currently Amended) The method as claimed in claim 44, further comprising ~~the step of~~ abandoning each part of the layer that has too many defects to be repairable or avoidable, or that would be easier to abandon than to repair or to avoid.

54. (Currently Amended) The method as claimed claim 44, wherein ~~the~~ scanning ~~step~~ comprises a plurality of probing steps, a different physical property of the material being probed during each probing step, each different physical property having a data set processable to form a map.

55. (Previously Presented) The method as claimed in claim 54, wherein each map is combined with one or more of the other maps to provide a composite map.

56. (Previously Presented) The method as claimed in claim 55, wherein each map is weighted relative to each other map when combined to provide the composite map.

57. (Currently Amended) The method as claimed in claim 44, wherein the layer is a thin film of super-conducting material, and ~~the step of~~ scanning further comprises ~~a step of~~ testing whether the coil track superconducts.

58. (Currently Amended) The method as claimed in claim 57, wherein ~~the step of~~ testing uses a binary search method thereby locating a part of the coil track that does not have predetermined superconducting properties.

59. (Currently Amended) The method as claimed in claim 58, wherein the binary search method uses contact brushes that are moved in an iterative procedure to locate ~~the or~~ each defective area.

60. (Previously Presented) The method as claimed in claim 59, wherein the binary search method uses a probe to perturb the superconductive properties locally.

61. (Currently Amended) The method as claimed in claim 60, wherein ~~the step of~~ testing uses a probe spot method thereby locating a part of the coil track that does not have predetermined superconducting properties.

62. (Currently Amended) The method as claimed in claim 57, wherein ~~the step of~~ testing uses a dynamic testing technique locating a part of the coil track that is non-superconductive, the dynamic testing technique being dependent on at least one dynamic variable.

63. (Previously Presented) The method as claimed in claim 62, wherein the at least one dynamic variable is a speed of rotation of the former divided by a probe repetition frequency.

64. (Currently Amended) The method as claimed in claim 57, further comprising ~~the step of~~ producing a result from the ~~step of~~ testing indicating whether the coil track superconducts, the result being portrayed as a map of the coil track, the map indicating each part of the coil track that has poor superconducting properties, and a location of each part of the coil track that has poor superconducting properties.

65. (Currently Amended) The method as claimed in claim 64, further comprising ~~the step of~~ abandoning a part of the coil track that has poor superconducting properties.

66. (Currently Amended) The method as claimed in claim 65, further comprising ~~the step of~~ interconnecting those parts of the coil track that are not abandoned.

67. (Currently Amended) The method as claimed in claim 64, further comprising ~~the step of~~ repairing a part of the track that has poor superconducting properties.

68. (Previously Presented) The method as claimed in claim 44, wherein the layer is a buffer layer or a metallization layer.

69. (Previously Presented) The method as claimed in claim 68, wherein the coil track is formed in a subsequent layer.

70. (Previously Presented) The method as claimed in claim 44, wherein the former defines a substantially right circular cylindrical surface and the coil path defines a substantially spiral track about the former.

71. (Currently Amended) The method as claimed in claim 44, wherein ~~the step of~~ defining the coil track includes writing or patterning a path in the layer.

72. (Currently Amended) The method as claimed in claim 44, further comprising ~~the step of~~ depositing, shaping and texturing the material comprising the layer to form the track by defining the path, in situ, on, or in, the surface of the former.

73. (Currently Amended) A computer-readable medium storing computer-executable instructions for performing ~~the steps recited in claim 44~~ a method by a computer for determining an optimal path of a coil track in a layer of thin film material for use in a superconducting coil, the method comprising:

receiving a data set representing a physical property of the material comprising the layer;

processing the data set to form a map having features indicating variations in the physical property over the layer;

analyzing the features of the map to identify and locate defects in the layer;

for each of the defects, identifying whether the defect is irreparable; and

calculating the optimal path of the coil track, wherein the path avoids any irreparable defects.

74. (Currently Amended) A device comprising a coil track in a layer of thin film material fabricated as a result of performing ~~the method of claim 44~~ a method, the method comprising:

scanning the layer to detect defects in the layer by probing a physical property of the material comprising the layer before the coil track is defined in the layer, to provide a data set of the physical property;

processing the data set to form a map having features indicating variations in the physical property over the layer;

analyzing the features of the map to identify and locate defects in the layer;

for each of the defects, identifying whether the defect is irreparable;

calculating an optimal path, wherein the path avoids any irreparable defects; and

defining the optimal path in the layer to define the coil track.

75. (Previously Presented) The method as claimed in claim 44, further including:

depositing, shaping and texturing the material comprising the layer; and

forming the coil track.

76. (Previously Presented) Apparatus for fabricating a track, the track being formed in a layer of thin film material for use in a superconducting coil, the layer provided on a former having a substantially curved surface, the track thereby being defined by a path being defined into or onto the layer, the apparatus comprising:

a scanner for scanning the layer to detect defects in the layer, the scanner comprising a probe for probing a physical characteristic of the material comprising the layer, the probe being arranged to transmit a signal comprising a data set of the physical property;

a memory for storing data;

a processor connected to the memory and the scanner, the processor being configured to:

control the probe and to receive the signal transmitted by the probe,

process the signal, thereby extracting the data set,

process the data set to form a map having features indicating variations in the physical property over the layer,

analyze the features of the map to identify and locate each defect in the layer

identify each defect that is irreparable,

calculate an optimal coil path, wherein the path avoids any irreparable defects, and

direct the data set and the map to the memory for storage; and

a coil writer connected to the processor, the processor being configured to control the coil writer to define the optimal coil path into or onto the layer, thereby defining the coil track.

77. (Previously Presented) The apparatus as claimed in claim 76, further comprising a repairer, the repairer being connected to the processor, the processor being configured to identify those defects that are repairable and to control the repairer to repair the reparable defects.

78. (Previously Presented) The apparatus as claimed in claim 76, wherein the processor is further configured to:

calculate the optimal path in order to abandon each part of the layer having too many defects to be repairable or avoidable, or each part that would be more easily abandoned than repaired or avoided; and

control the coil writer to interconnect those parts of the layer not abandoned.

79. (Previously Presented) The apparatus as claimed claim 76, wherein the processor is further configured to adapt the calculation of the optimal path such that the coil track produces a magnetic field that is predetermined.

80. (Previously Presented) The apparatus as claimed in claim 76, the layer being a thin film of superconducting material, the scanner comprising a coil tester, the processor connected to the coil tester and being configured to control the coil tester, wherein the processor controls the coil tester to locate weakly superconducting areas of the coil track by using a probe test or an electrical test or a combination of both, and wherein the processor calculates the optimal path in order to abandon a part of the coil that has poor superconducting properties.

81. (Previously Presented) The apparatus as claimed in claim 76, wherein the scanner comprises a plurality of probes, each probe configured to detect a different physical property of the material and create a different data set, and the scanner transmits the data set to the processor, and wherein the processor is further configured to process each data set to form a map of the variations of the corresponding material properties of the layer and to combine one or more of the maps of different physical properties to provide a composite map.

82. (Previously Presented) The apparatus as claimed in claim 76, wherein the layer is a buffer layer or a metallization layer.

83. (Previously Presented) The apparatus as claimed in claim 76, further including a deposition device being arranged to deposit, shape and texture the layer, in situ, on the surface of the former, wherein the apparatus is further arranged to form the track.

84. (Currently Amended) A method of fabricating a track in a layer of thin film material for use in a superconducting coil, the layer provided on a former having a substantially curved surface, the method comprising ~~the steps of~~:

scanning the layer to detect defects in the layer by probing a physical property of the material comprising the layer, before ~~the~~ a coil path is defined in the layer, to provide a data set of the physical property;

processing the data set to form a map, the map having features indicating variations in the physical property over the layer;

analyzing the features of the map to identify and locate defects in the layer;

for each of the defects, identifying whether the defect is irreparable;

calculating a ~~number~~ plurality of coil paths so as to avoid the irreparable defect(s);

choosing one of the coil paths as an optimal path; and

forming the optimal path in the layer to define the coil track.

85. (Currently Amended) A method of fabricating a track in a layer of thin film material for use in a superconducting coil, the layer provided on a former having a substantially curved surface, the method comprising ~~the steps of~~:

scanning the layer to detect variations of a physical property in the layer by probing the physical property of the material comprising the layer, before ~~the~~ a coil path is defined in the layer, to provide a data set of the physical property;

processing the data set to identify and locate variations of the physical property in the layer;

choosing an optimal path based on the variations in the physical property; and

defining the optimal path in the layer to define the coil track.

86. (Currently Amended) The method as claimed in claim 85, wherein a defect in the layer is indicated by the variations in the physical property in the layer, and wherein the method further comprises ~~the steps of~~:

identifying whether each defect is a repairable defect; and

repairing each repairable defect.

87. (Currently Amended) The method as claimed in claim 85, wherein ~~the step of~~ choosing the optimal path includes ~~the step of~~ calculating the optimal path.

88. (Currently Amended) The method as claimed in claim 85, wherein a defect in the layer is indicated by the variations in the physical property in the layer, and ~~the step of~~ choosing the optimal path includes avoiding any defect.

89. (Canceled).

90. (Currently Amended) The method as claimed in claim 85, wherein the processing ~~step includes the steps of~~ comprises:

forming a map having features indicating the variations in the physical properties over the layer; and

analyzing the features of the map to identify and locate defects in the layer, wherein a defect in the layer is indicated by variations in the physical property in the layer.

91. (Currently Amended) An apparatus for fabricating a track, the track being formed in a layer of thin film material for use in a superconducting coil, the layer provided on a former having a substantially curved surface, the track thereby being defined by a path being defined into or onto the layer, the apparatus comprising:

a scanner ~~for scanning~~ configured to scan the layer to detect variations of a physical property in the layer, the scanner comprising a probe ~~for probing~~ configured to probe the physical property of the material comprising the layer, the probe being configured to transmit a signal comprising a data set of the physical property;

a memory ~~for storing~~ configured to store data;

a processor connected to the memory and the scanner, the processor being configured to:

control the probe and receive the signal transmitted by the probe,

process the signal, thereby extracting the data set,

process the data set to identify and locate the variations of the physical property in the layer,

choose an optimal coil path based on the detected variations in the physical property, and

direct the data set ~~and the map~~ to the memory for storage; and

a coil writer connected to the processor, the processor being configured to control the coil writer to define the optimal coil path into or onto the layer, thereby defining the coil track.

92. (Previously Presented) The apparatus as claimed in claim 91, wherein a defect in the layer is indicated by variations in the physical property in the layer, and in processing the data set the processor is further configured to:

form a map having features indicating variations in the physical property over the layer; and

analyze the features of the map to identify and locate each defect in the layer.

93. (Previously Presented) The apparatus as claimed in claim 91, wherein in choosing the optimal coil path the processor is configured to calculate the optimal coil path.

94. (Currently Amended) ~~Apparatus~~ The apparatus as claimed in claim 91, wherein a defect in the layer is indicated by the variations in the physical property in the layer, and in choosing the optimal coil path the processor is configured to avoid any defect.

REMARKS/ARGUMENTS

Reconsideration and allowance are respectfully requested. No new matter is added by the amendments herein.

Subject Matter Indicated as Allowable

Applicant acknowledges and appreciates the Examiner's indication that claims 44-73, 75-88, and 90-94 are allowed, and that claim 74 would be allowed if amended to correct a formality.

Drawings

Figures 1 and 5 are objected to for not including text labels for reference numbers 12, 14, 16, 18, and 21 in Figure 1, and reference numbers 90, 92, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, and 118 in Figure 5.

Applicant has added the requested text labels in both figures, and submitted these as replacement drawing sheets.

Claim Objections

Claims 44, 49, 59, 84, 85, and 91 are objected to for various informalities. Applicant has amended these claims, and it is believed that the objection is overcome as to these claims.

The Office Action has also noted that, because claim 89 was missing, claims 90-94 should be renumbered. However, because no defined procedure exists for renumbering claims, Applicant has designated claim 89 as "canceled." It is believed that the numbering of claims 90-94 should now be considered appropriate.

Rejection Under 35 U.S.C. § 112, Second Paragraph

Claim 74 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Office Action alleges that claim 74 (which depended from claim 44) is unclear as to what device is being claimed that is a result of defining the path and/or coil track as recited in the method of claim 44.

Claim 74 is rewritten in a manner that is believed to overcome this rejection. Specifically, claim 74 as amended recites a device that results from at least a portion of the recited method. For example, the recited device comprises a coil track in a layer of thin film

material, where the track in the layer is fabricated as a result of, e.g., "defining the optimal path in the layer to define the coil track," as recited in claim 74.

Miscellaneous Amendments

Some of the allowed claims have been further amended in various ways, such as for clarity, that are not believed to affect the patentability of the allowed claims.

Conclusion

All objections and rejections having been addressed, it is submitted that the present application is in condition for allowance. Should the Examiner have any questions, the Examiner is invited to telephone the undersigned at the number below.

Respectfully submitted,

BANNER & WITCOFF, LTD.

Dated: April 20, 2010

By: /Jordan N. Bodner/
Jordan N. Bodner
Registration No. 42,338

1100 13th Street, N.W.
Suite 1200
Washington, D.C. 20005-4051
(202) 824-3000